rheumatism and nodular accumulations in the tendons in the region of the hand and fingers, and has numbers of tophi. One brother healthy and strong, but also inclined to be of a nervous disposition. Two sisters living and healthy.

The patient had children's diseases—measles, whooping-cough, mumps, and chickenpox—and slight rheumatism. No venereal disease, and knows of none in his family. Habits have been good as to alcohol and tobacco. Has had hay fever for three years past.

The present disease began in 1896, during the second year of his medical course. He managed to get through the year, although his symptoms gradually grew worse until he stopped work in May, 1897. He improved during the summer, and returned to work in October, 1897.

Soon after his return the same symptoms reappeared, and he was forced to leave the University for the year. During the two winters in the city he received treatment for lithæmia and chronic gastritis by means of diet and various drugs and tonics. During the spring and summer of 1898 he was employed in duties that kept him much in the open air, and he returned to study in the autumn, very much improved.

When first seen, in October, 1898, he presented the following symptoms: Dulness of intellect, slight tinnitus aurium, specks before the eyes, twitching of muscles of the face, no headache, but a feeling of dizziness; sounds seemed far off, and there was considerable mental depression. He complained of insomnia—it took him from one to four hours to get to sleep; he was not refreshed, and dreamed a great deal. He also complained of a bad taste in his mouth. The tongue was furred. He suffered from gaseous eructations, and sometimes directly after eating, but sometimes not until an hour or more had passed. There was practically never any regurgitation of food. As a rule, there was no pain, but sometimes he suffered from colic. Flatulence and borborygmus occasionally was quite decided. Stools were normal and regular. There was some twitching and tenderness of the muscles. There were, however, no signs of tetany. There were nodules in the cartilages of the ear and tendons of the hands.

Physical examination of the lungs and heart showed them to be healthy. The abdominal organs were in their normal position. The urine was of high color and specific gravity. It showed nothing abnormal, but was somewhat scanty. The blood-count showed 3,000,000 red cells per cubic centimetre. The skin was harsh and dry, and the hair was falling out. The stomach was washed out before breakfast, and about 100 c.c. of fluid, with small particles of food, were always obtained. Splashing could be heard in the stomach area before breakfast. The stomach was inflated with air repeatedly, and a considerable amount of dilatation without gastroptosis was always demonstrated by this method. The size and condition of the stomach did not change materially during the time in which he was under observation. An Ewald test breakfast was given, and one hour afterward 70 c.c. of fluid were obtained by aspiration. Hydrochloric acid was present in good quantity and lactic acid was also absent. Microscopical examination showed a few red blood-cells and considerable mucus. In washing out the stomach the water flowed in freely, and two or three litres were taken without discomfort. The return flow was, however, slow and unsatisfactory. The full amount sent in at any time was never recovered, and the washing never came away clear, even after forty minutes' work. After Christmas he finally gave up his medical course and went to his home in the mountains of Northern Pennsylvania. He has since improved considerably, both in his general health and gastric symptoms.

CASE II. (J. D. S.).—Male, aged twenty-five years, single; student in the architectural department; born in the United States. Father and mother both living and well. No tubercular or rheumatic family history. There does not seem to be any neurotic taint in the family. The patient had measles, whooping-cough, and varicella in childhood. He appears to have been perfectly healthy, and led an active and outdoor life up to his seventeenth year in one of the States in the Northwest.

He does not smoke, but takes an occasional glass of beer. Has never had any venereal disease, and there is no history of sexual excess. He lived at home and led a regular life. In October of his eighteenth year he began work in a cold, damp office, and became somewhat indiscreet in his diet, using an excessive amount of sweets. He then began to suffer from frequent attacks of indigestion. In time a subacute gastritis appears to have developed. He complained of fulness in the epigastrium after eating, and pain in the same region, usually about three hours after eating. There was very little eructation. Constipation was often very obstinate. These symptoms were aggravated by any indiscretion in diet. He lost about eighteen pounds in weight. His gastric symptoms gradually grew worse. For the next six years he worked in an architect's office at draughting, using his eyes continuously, and during this period he suffered more or less with gastric trouble. In his summer vacation he says he was very well, and could eat almost anything.

In September, 1897, he came to the University, and soon after commencing work his gastric symptoms became much aggravated. He came under observation in January, 1899.

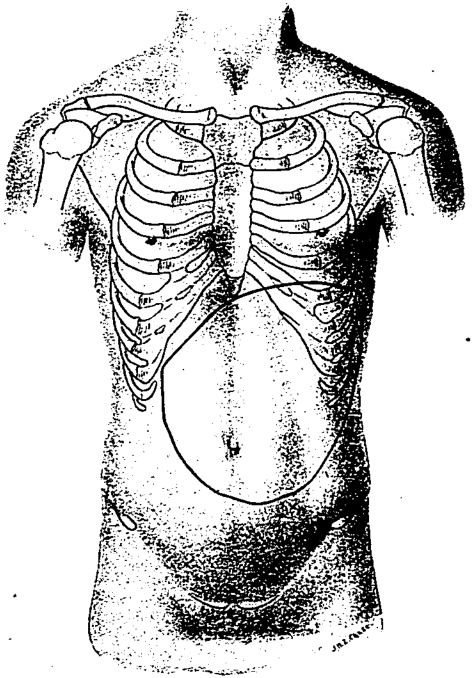
Examination at this time showed the lungs, heart, and abdominal viscera, except the stomach, to be free from disease. The urine was somewhat scanty and high-colored, but showed nothing upon examination except that the specific gravity was above the normal. He was slightly sallow and under weight for a man of his height.

His tongue was covered with a thick, white coating. He complained of fulness in the epigastrium and pain several hours after eating. No vomiting. There were eructations about an hour after eating of bitter, sour fluid, and an almost constant sour taste in the mouth. There was some insomnia and also mental inactivity, and considerable frontal headache. No muscular twitching; no symptoms of tetany. Knee-jerks were normal.

Examination of his stomach: By percussion the pylorus appeared to reach somewhat to the right of and below the umbilicus. The abdominal walls were relaxed. There were no peristaltic waves visible. About the lower border of the stomach there was distinct splashing. No point of tenderness and no tumor could be found. His stomach was washed out before breakfast, and by aspiration about 100 c.c. of fluid, mixed with mucus, were withdrawn. It was always difficult to withdraw the contents, and aspiration had to be resorted to. Expression always failed. Inflation showed the organ to extend below the umbilicus and three finger-breadths to the right.

An Ewald breakfast (a roll and one-half pint of fluid) in one hour gave 100 c.c. of fluid. Hydrochloric acid was present in small amount: lactic acid present. Some mucus, no blood, and no sarcinæ. The water flowed in easily, but it was difficult to empty the stomach and almost impossible to cleanse it thoroughly.

FIG. 1.



By inflation.

His work continued hard, and the aim of treatment was to enable him to graduate, and then to hope to relieve him by rest. However, he greatly improved, and by April 25th, while his stomach-wall was still much relaxed, as shown by inflation (Fig. 1), there was no fluid before breakfast, and the evidences of fermentation were almost gone

He slept better and could concentrate his mind to do more work. Examination of his gastric contents after a test-meal showed hydrochloric acid present, but no lactic acid.

Just after graduation, in June, his stomach was still relaxed, and he was in practically the same condition as in April. He was referred to Dr. Zimmerman in April, who reported considerable eye-strain, hypermyopia, and astigmatism. Correction by glasses relieved his headache, but seemed to have no marked effect upon his gastric symptoms. After going home he reported himself much improved by rest and the change of air.

CASE III. (J. H. M. and J. D. S.).—Male, aged twenty-eight years; medical student. Born in Pennsylvania; single. Family history is good except that mother has suffered much from acute articular rheumatism. One sister has had frequent attacks of rheumatism.

The patient's habits are good. Never took alcohol or smoked. No history of venereal disease. The patient had scarlet fever and diphtheria in childhood. Had an attack of lumbago at twenty-six years, but no other rheumatism. At sixteen years he had an attack of "nervous prostration" that lasted for six months, during which period he suffered considerably with weak, slow, and irregular heart and palpitation. His digestion was very poor, but the bowels were regular, and he had no fever. He recovered and became very strong and well, and led a healthy out-door life. He weighed 170 pounds.

He entered college in 1892, in perfect health. He had to work his way by canvassing in the summer, and this, with hard studying, almost broke him down in February, 1894, but he managed to graduate. He was suffering at that time with about the same symptoms as at present—insomnia, dulness, and inability to work, fulness in epigastrium after eating, but no constipation.

After graduation he came up quickly under complete rest, but had recurrences of the same trouble at intervals, when working hard, for the next two years. His meals were irregular and food not always of the best, and he has always eaten rapidly, with insufficient mastication.

After a summer of very hard work at his business he entered the medical school. In November he gave out completely. His symptoms were those given, but aggravated.

After a period of rest at home, with proper diet, he recovered a fair degree of health. He returned to the medical school, and by great care managed to get through the next two years, studying hard and working in the summer.

He came under observation May 3, 1899. He then had insomnia, muscular relaxation, and pains throughout the body. There was considerable pain in the epigastrium and left hypochondrium an hour or so after eating. There was much gurgling and some eructations of sour, bitter material, but no vomiting. There was considerable constipation. He suffered from attacks of bradycardia alternating with palpitation, especially after eating, and had considerable vertigo and dimness of vision.

Urine. Highly colored, lately rather scanty, and occasionally scalds him. Examination of it shows nothing abnormal, except a high specific gravity and an excess of indican. Thirst was not marked; and appetite fairly good.

Examination. Was not particularly emaciated, but sallow. He weighed 130 pounds. No symptoms of tetany. Knee-jerks present, and pupillary reflexes normal. Teeth in fairly good condition. Tongue was heavily furred. Examination of lungs and heart showed them to be healthy. Liver, spleen, and kidneys appeared to be of normal size and location. There was no sign of either gastroptosis or enteroptosis.

Examination of the stomach showed considerable splashing about the level of the umbilicus. By percussion the pylorus appeared to be below and to the right of the umbilicus. The walls, as felt through the abdominal walls, seemed relaxed. No peristaltic wave could be invoked. No tumor could be discovered.

The stomach-tube passed before breakfast brings out 150 c.c. of greenish fluid. After an Ewald breakfast of several slices of toast and 500 c.c. of weak tea and milk, 100 c.c. were recovered by aspiration. The contents of the stomach could never be expressed, and were seldom evacuated through the tube by vomiting, but always had to be removed by aspiration. Water in lavage flowed in readily, but it was difficult to recover it.

Chemical examination of the fluid obtained after a test meal on several occasions showed the total acidity to be 54. Hydrochloric acid present and lactic and butyric acids absent. There was always much mucus raised through the tube.

Inflation of the stomach showed much relaxation. The result of this procedure varied very little while he was under observation.

The patient finished his year without much trouble, and seemed to gain slightly. After a summer in the open air he has greatly improved. His stomach now does not reach to the umbilicus, though he still suffers from fermentation. The stomach-tube shows no fluid in the fasting stomach before breakfast, and after an Ewald test breakfast 25 c.c. are obtained. The chemical examination is about the same as before. He has gained sixteen pounds.

CASE IV. (J. H. M.)—Male, aged twenty-two years; dental student. A native of the United States. His family history is good. Father, mother, one brother, and one sister alive and well. One sister died in babyhood. No rheumatic or tubercular family history.

The patient had pertussis and measles in childhood. Had also had mild attacks of influenza and a couple of attacks of chills and fever. He has used alcohol in moderation; has not had any venereal disease, but from his seventeenth year has smoked to great excess, mainly cigarettes, and has also chewed tobacco. In October, 1896, he began to experience palpitation and irregularity of the heart's action.

Soon signs of gastric disturbance were added, consisting of acid eructations, fulness after meals, no nausea, and regular bowels. He gradually grew worse, and in the fall of 1897 grew very anæmic, and entered the Presbyterian Hospital under Dr. Musser's care. He continued the use of tobacco until his admission into the hospital.

A note of the examination made then is as follows: "Patient has slept well since admission and has been very comfortable. There have been occasional eructations of acid material, but these have now disappeared. He looks very anæmic, but is always bright and cheerful. On one occasion in giving lavage he retained 4500 c.c. of water. This amount, however, caused him no inconvenience. His stomach has been dilated with air, and the stomach tympany was mapped out by auscultatory percussion."

The result showed that the greater curvature extended two fingerbreadths below the umbilicus; the pylorus was on the right mid-clavicular line, on the costal margin, and the lesser curvature was on the level of the ensiform.

His blood-count upon January 24, 1898, was: Red cells, 4,100,000; white cells, 6000; hæmoglobin, 62 per cent. While in the hospital he was free from fever. The urine was about normal in amount and specific gravity.

Under appropriate treatment—lavage, rest, massage, and discontinuance of tobacco—he greatly improved. The gastric symptoms lessened, and on February 4th his blood-count was as follows: Red cells, 4,210,000; hæmoglobin, 72 per cent.

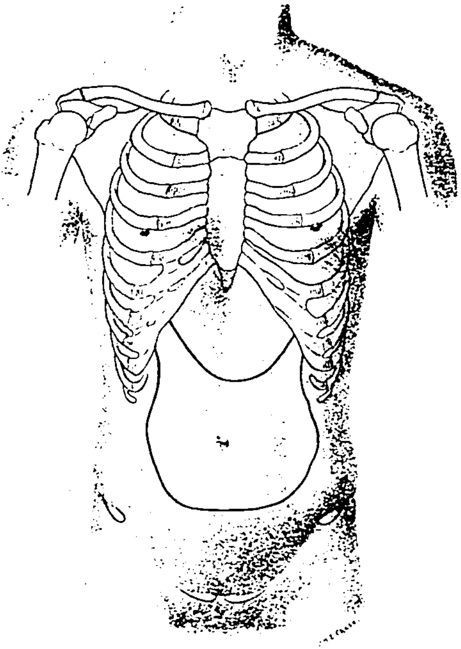
After leaving the hospital he returned home and led an active outdoor life, with regular habits and without smoking to excess, until the autumn of 1898, when he again entered the dental school. He had taken fair care of himself, did not study excessively, and did not smoke to excess, except occasionally. In April, 1899, he again came under observation, complaining of some discomfort after eating, and occasionally acid eructations, but was feeling fairly well. The stomach-tube was passed, and his stomach was found to be empty before breakfast. He retained a pint and a half of water, which was recovered with ease. One hour after an Ewald breakfast but 25 c.c. of fluid could be recovered, mixed with much mucus. No free hydrochloric acid; no lactic acid. When the stomach was filled with air considerable dilatation was found. With attention to diet and simple medication his gastric symptoms soon disappeared entirely.

Case V. (J. H. M. and J. D. S.).—Male, aged twenty-two years; medical student. His mother and father are living and well, except that his mother has had some slight stomach trouble, evidenced by occasional attacks of gastritis. One brother has a weak stomach, and was troubled in much the same way as the patient is when at the same age. He has four sisters, all healthy.

The patient was perfectly well up to the age of fourteen years He had no diseases of childhood He went away to school at this age, and soon began to have occasional attacks of acute pain in the stomach, with headaches and constipation. While at school he was very careful in his habits, but in the summers he used alcohol and tobacco to excess. He had never vomited. The symptoms gradually grew worse until he came under observation, in October, 1899. During the summer he had been washing out his own stomach once or twice a week, with considerable relief of his symptoms. He then had occasional pain in the epigastrium, eructations of gas and bitter material after meals, constipation, headache, and inability to concentrate himself upon his studies. He has always been a rapid eater. He had some muscular insufficiency of his eyes for several years, and up to a year ago—when his eyesight was corrected by glasses—suffered much from granular lids and could not use his eyes at night.

The examination showed that his heart and lungs were healthy, and that the kidneys, liver, and spleen were in their normal positions. No fluid was found in the fasting stomach before breakfast. The inflow was very easy and the outflow difficult. The stomach contents were removed sixty minutes after an Ewald test breakfast, and 70 c.c. were recovered. Hydrochloric acid was present, lactic acid absent, butyric acid absent. The total acidity was 60. Inflation showed that there was considerable gastroptosis. The pylorus was in the mid-clavicular line, at the costal margin. The lesser curvature was half-way between the ensiform and umbilicus. The greater curvature was three finger-breadths below the umbilicus, showing that there was considerable dilatation as well as atony (Fig. 2). The patient could not take more than 1000 c.c. of water in his stomach without discomfort.

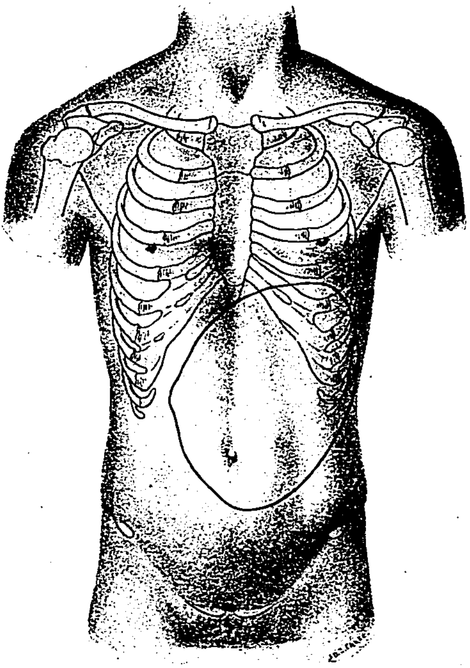
FIG. 2.



By Inflation.

CASE VI. (J. H. M.).—Male, aged twenty-two years; law student. His mother is neurasthenic, but with this exception the family history is good. No bad habits; no smoking or stimulants. Had typhoid fever in 1895, and since then had had some bowel disturbance, which increased in 1898 to an extreme degree. The symptoms began with constipation, which soon turned into chronic diarrhœa. During this time he had several large movements a day, containing mucus and blood. When first seen, in February, 1899, he had one stool a day, which contained at first fecal matter, and then became very loose. Ever since the attack of typhoid fever quoted above he suffered with eructations of gas and fluid, beginning some little time after meals, and with fulness in the stomach after eating. He was very nervous, easily exhausted, worn and emaciated, and had lost considerable weight. He

FIG. 3.



By inflation.

was unable to study. He had a marked splashing sound, and tympany extended to the right of the median line.

The stomach-tube brought away considerable undigested and fermented food, indicating considerable gastric atony. Inflation showed that the stomach was much dilated. The greater curvature was three finger-breadths below the umbilicus, and the lesser curvature at the ensiform cartilage. There was consequently dilatation with no gastroptosis (Fig. 3).

CASE VII. (J. H. M.).—Male, aged nineteen years; medical student. His family history is very good. The patient has always been healthy, except that he has been somewhat troubled with constipation and flatulency at various times. He has led an active life, a good deal of the time in the open air. He has smoked considerably during the past year. There was no trouble with his eyes.

The present illness began with flatulency, accompanied by pain and tenderness around the umbilicus. The pain gradually spread over the whole abdomen. It seemed to be of a nervous character, becoming much more severe during excitement of any kind. There was no nausea or vomiting at any time. From August, 1898, to October, 1898, he lost twenty-two pounds, and became much weakened.

The stomach-tube brought away a considerable amount of fermented material from the stomach. Upon washing out the stomach two hours after a test breakfast consisting of meat and toast, aspiration brought away much undigested food and a considerable amount of fluid. In washing out the stomach the inflow was very rapid, causing an eddy in the funnel, but it was extremely hard to withdraw the gastric contents or to siphon away the washage water. Inflation showed considerable dilatation. The greater curvature extended two finger-breadths below the umbilicus, and the cardiac end extended up to the fifth rib on the anterior axillary line, and the lesser curvature was on a level with the ensiform.

CASE VIII. (J. H. M.)—Male, aged twenty-four years; college student; white; single. His mother has asthma and hay fever, but otherwise the family history is very good. The patient smoked to excess, and used beer and probably other stimulants at least injudiciously. He did not overwork. He had been healthy all his life, with the exception of an attack of chronic malaria three years ago, which lasted for one year. For two years he had had gastric disturbance, fulness after eating, eructation of gas and bitter material. His thirst had been somewhat excessive, and the urine had been scanty and of high color.

The stomach-tube was passed forty minutes after a small test breakfast, and 25 c.c. were recovered. A large amount of bread and fluid came with the washing. The odor was slightly sour; total acidity 40; free hydrochloric acid was present. The total hydrochloric acid was 8. There was no lactic or butyric acid. Peptones and starches were present, and a trace of bile. The water ran in rapidly and siphoned out with difficulty. The greater curvature was three finger-breadths below the umbilicus, and the pylorus was two-thirds of the way to the right midclavicular line. The lesser curvature crossed the ensiform. There was no gastroptosis. The patient suffered much from a mental inactivity and weakness.

When the stomach-tube was passed he had a clonic spasm of the extensor muscles of the arms and legs, with external rotation. Trousseau's sign was not obtained, and there was no response when stimulating the facial nerve.

DIAGNOSIS. In establishing a diagnosis of motor insufficiency the following signs are of most value:

1. The presence of undigested food and fluid in the stomach fasting over night. The stomach is never entirely empty, as was the case in all but one of our series. This symptom is recognized by all authors to denote a decided lack of motor power. The rule laid down by Riegel in this connection is that when food and fluids are found seven hours after a meal the stomach is lacking in motor power.

2. The manner of inflow and outflow of water when the stomach-tube is used is characteristic. The water flows in with great ease, causing a whirlpool in the funnel, and was removed with great difficulty. The rapidity with which the water enters and the difficulty with which the contents of the stomach are removed appear to us to be an evidence of weakness in the gastric muscle. In enlargement of the stomach due to obstruction of the pylorus the gastric contents can be expressed with more or less ease. Water flows in slowly and flows out with great readiness. This is due to the hypertrophy of the muscle-wall of the stomach caused by its efforts to overcome an obstruction at the pylorus. On the other hand, if the walls of the stomach are relaxed from inherent weakness, then water flows in readily, the contents cannot be expressed, and it is difficult to empty the stomach entirely by siphonage.

3. Inspection of the abdomen—a point upon which Osler and Allbutt lay much stress—has been, in our experience, a sign of somewhat negative value in cases of dilatation from atony. It is possible that they refer more especially to cases of dilatation from obstruction when they speak of marked prominence in the right upper quadrant of the abdomen. All of our series, in which there was no gastroptosis, showed a slight protrusion in this region, and one case—Case V., in which there was considerable gastroptosis—showed a slight flattening in the epigastrium, with some protrusion at the level of the umbilicus.

4. In none of our series were peristaltic waves seen through the abdominal wall, nor could they be invoked by stimulation. This is another point in favor of the view that the dilatation was due to weakness of the gastric muscle. In cases in which the stomach enlarges by reason of obstruction in the pyloric end peristaltic movements are very frequently observed. This is explained by considering the fact that the gastric muscle in cases of dilatation from obstruction is much stronger and more active than in cases of dilatation from atony.

5. Riegel and Allbutt lay stress upon the fact that in atonic conditions of the stomach-wall palpation may throw considerable light upon the condition of the stomach. The walls of the stomach in such cases, as felt through the abdominal wall, are relaxed and flabby. To obtain

this sign, however, the abdominal parietes must be exceedingly thin and relaxed—a condition that was not present in any of our cases, and, consequently, we could not consider it of much value.

6. Evidences of fermentative processes in the stomach were almost invariably present. These were eructations of gas or bitter material, muscular weakness, lack of mental activity, and other signs of autointoxication. There were usually insomnia, inability to work, and diminished power of concentration. Some muscular pain and twitching were present in all of our cases. Case VIII. had an attack of muscular spasm that might be considered tetanoid, although the symptoms were not entirely characteristic. It always occurred during lavage. In other cases no symptoms of tetany were observed, as evidenced by our failure to obtain any disturbance in stimulating the facial nerve or to get Trousseau's sign.

7. The urine was almost always concentrated and small in amount. The fact that water is not absorbed by the stomach-wall would seem to make the scantiness of the urinary secretion a sign of value in making the diagnosis of motor insufficiency, and is so recognized by the principal authorities.

In all of our cases the appetite was good. Thirst was moderate, and the bowels usually constipated.

In determining the size and position of the stomach we consider inflation with air through the stomach-tube by means of an ordinary Davidson syringe to be the easiest and most reliable method. While we recognize the value of Dehio's procedure of causing the patient to drink measured quantities of water, and percussing the lower border of the stomach before and after, we think this method has the serious objection that by its use the position of the lesser curvature cannot be definitely determined. Moreover, its only advantage in the determination of the position of the greater curvature is that it does away with the necessity of passing the stomach-tube.

The amount of water that can be passed into the stomach may also be looked upon as a sign of value in determining the existence of dilatation, but it cannot be considered absolutely reliable. The maximum capacity of a normal stomach, which is placed at 1500 c.c. by Ewald and 1680 c.c. by Ziemssen, has been shown by Pepper and Stengel to be in some cases as high as 2600 c.c. The mental attitude of the patient seems to be a considerable factor in determining the capacity of the stomach by this method, and some will complain of fulness before the amount of water poured through the tube reaches a quantity at all commensurate with the degree of dilatation that inflation with air shows to be present. It must be considered, too, that the stomach, about to be filled with water, may contain considerable gas, the result of fermentation, which cannot find an outlet along the stomach-tube or through the pylorus. This may cause considerable distention before the water enters, and, naturally, the amount of water required to produce a sense of fulness would be much too small to indicate correctly the capacity of the stomach. Cases II., III., IV., VI., VII., and VIII. held at different times quantities of water varying from two to four litres, and this must be considered an evidence of increased capacity. Case V., on the other hand, could take but 1000 c.c. without discomfort, although there seemed to be some dilatation, as shown by inflation, and the signs of motor insufficiency were well marked.

The gastric secretion was not disturbed to a marked degree in any of our cases. In none was there hyperacidity, and free hydrochloric acid was found in all at some time while under observation. Lactic acid was present occasionally in Case II., but hydrochloric acid was usually present as well.

One of the most comprehensive classifications of the varieties of this condition is that given by Hemmeter, based upon the work of Riegel and Boas. It is as follows: First, simple gastric atony or motor insufficiency without dilatation. Second, atonic dilatation due to relaxation of the gastric walls without pyloric stenosis. Third, secondary dilatation due to pyloric stenosis. But to classify the cases of dilatation into those of dilatation from atony, and dilatation from obstruction, as indicated by Pepper and Stengel, seems all-sufficient. From the study of the general symptoms given above, and of the evidence of the size and position of the stomach obtained by inflation, we consider that all of our cases are to be placed under the second heading of Hemmeter's classification or under the first heading of Pepper and Stengel. It is to be remembered that in Case V. there was also some gastroptosis.

In several cases the occasional absence of hydrochloric acid appears to indicate a considerable amount of chronic gastritis that probably antedated the motor insufficiency. The relations of the two conditions will be considered under the heading of etiology.

The differential diagnosis does not seem to be difficult. It is necessary to exclude pyloric obstruction from malignant disease, from scar formation due to ulcer, or from spasmodic contraction and duodenal stenosis. The grounds upon which this diagnosis was based are as follows: 1. The absence of a history of gastric ulcer and hemorrhage from the stomach. 2. The age of all of our cases, being too young for cancer. 3. The absence of any sign of peristaltic action in the stomach-wall as seen or felt through the abdominal walls, denoting a weakness of the muscle and not the usual hypertrophy seen in the early stages of pyloric obstruction. 4. The rapid inflow of the water through the stomach-tube, and the difficulty of removal of the stomach-contents, showing lack of power in the stomach-wall. 5. The absence of any sign of tumor. 6. The absence of bile in the stomach contents, indicating duodenal stenosis. 7. The presence of hydrochloric acid in all the cases at some period of observation.

The question of the existence of congenitally large stomach, or megalogastria, must also be considered. However, the symptoms of motor insufficiency were so decided that it must be assumed that the enlargement in every case was due to dilatation.

ETIOLOGY. In his article in Nothnagel's *System*, Riegel says: "The stomach weakness may be only a part of the manifestation of a general lack of strength, be it congenital or acquired. We see under the influence of severe exhaustion the evidences sometimes of irritation and sometimes of paralysis of the most varying nerve plexuses. There is no wonder, then, that under the same conditions the appetite may suddenly fail in some cases, while in others the peristalsis may be increased, or, in still others, atony and paralysis of the stomach may occur." It is seen that Riegel recognizes a variety of atonic motor insufficiency due to severe bodily and mental strain without a precedent history of chronic gastritis. He calls attention to the fact that the tendency to weakness of the stomach may be congenital, either on account of a similar localized weakness of the parents, or on account of an hereditary general bodily lack of resistance. Most authorities state that a chronic gastritis is a very frequent cause for motor insufficiency in dilatation. The vicious circle is established from lack of nutrition due to the gastritis, and the muscular layers of the stomach are affected either by an extension of the chronic inflammation from the mucous membrane of the stomach or as a result of general impairment of the bodily strength. Clifford Allbutt says in this connection: "From my own experience I should find it difficult to say whether catarrh or primary atony of the stomach were the commonest cause of dilatation of the stomach not dependent on pyloric stenosis or constitutional disease. A gastric catarrh, by reducing the value of the gastric secretion and promoting fermentation, is a potent means of setting up dilatation."

The etiology of each case will be considered in outline: Case I. The father was dyspeptic and the mother decidedly neurotic and gouty, and it is possible that the patient inherited the so-called tendency to a weak stomach; but, at all events, it is likely that his resistance was not great enough to stand the confined life and mental strain of a trying course of study. In Case II. there does not seem to be any predisposing cause, such as heredity, to explain the condition. It is probable that badly selected food and hard work before he entered the University produced a chronic gastritis, which led to dilatation from atony, and that the strain of hard study aggravated the condition. Case III. much resembled Case II. The effort of working his way through college and the medical school produced a degree of nervous exhaustion that would seem to be responsible for his condition. Case V. would appear to be an instance of a congenital weakness of the tissues supporting the stomach, which produced a considerable degree of gastroptosis. It is hard to say whether this gastric atony preceded or followed the displacement of the stomach. The early occurrence of this condition would indicate some congenital factor in its causation. It is possible that the gastroptosis played some part in the production of the dilatation, whether from traction and kinking of the duodenum or from some other cause. His occasional excesses in tobacco and alcohol probably aggravated the condition. In Cases IV., V., VI., and VIII. there was a history of excessive use of tobacco and of the at least injudicious use of other stimulants. These conditions combined probably caused a chronic gastritis, which resulted in considerable atrophy of the muscular layers and dilatation. Bouveret states that excessive smoking may in itself cause gastric insufficiency. Riegel, in commenting upon this statement, says that it is probable that the direct results of such narcotics is gastritis, which is followed by atony of the stomach-walls. Case VII. is probably one of dilatation from atony occurring during the course of or in the convalescence of an acute illness. The symptoms of intestinal and gastric disturbance can be traced directly to the attack of typhoid fever that occurred two years before he came under observation. It is well known that the strain of such an illness is an important factor in the causation of weakness in the gastric muscle.

It must have been observed in a review of the series of cases that the eyes were at fault in all but Case VII. It is an unsettled question whether such a condition is one of cause or effect, or whether the two are simply combined symptoms of trouble arising from a common cause in the nervous symptom. It is our experience that correction of eyesight by glasses appears to have a beneficial effect.

A boarding-house table, leading, as too many of them do, to careless habits and to great haste in eating, and in some instances furnishing a too great proportion of fried and fatty foods, renders it extremely difficult to treat such cases of motor insufficiency in students, and is probably a factor in the causation of the condition.

Our conclusions may be briefly given: 1. The symptoms upon which most reliance can be placed in determining the presence of gastric motor insufficiency are: (*a*) The presence of fluid and food in the stomach fasting over night; (*b*) the ready entrance of fluid through the tube and difficulty in the return flow; (*c*) the absence of visible gastric peristalsis; (*d*) evidences of fermentation and intoxication by the products thereof; (*e*) thirst, and (*f*) scanty and concentrated urine.

2. In determining the position and size of the stomach, by far the most certain method has been inflation by air through the stomach-tube; auscultatory percussion, Dehio's method, and determining the

capacity of the stomach by the amount of water required to produce a sense of fulness, while signs of value may lead to error.

3. It may be inferred from the somewhat small number of cases just reported that the condition is not uncommon in students. An analysis of the etiological factors is as follows: (*a*) Myasthenia caused by chronic gastritis from the abuse of alcohol and tobacco, four cases; (*b*) myasthenia from deficient innervation, two cases; (*c*) myasthenia, probably of congenital origin, one case; (*d*) myasthenia occurring in the course of acute disease, one case.

THE SURGICAL TREATMENT OF ACUTE PUERPERAL SEPSIS, WITH SPECIAL REFERENCE TO HYSTERECTOMY.[1]

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IT is not without considerable diffidence that I bring the subject of the surgical treatment of acute puerperal sepsis before you, feeling only too keenly that its gravity and importance call for some exponent who has had a more extensive and a longer experience than I have had. But my work in this direction has met with such strong opposition, and has been subjected to so much unfavorable criticism, open and covert, and my attitude has so often been misunderstood, that I am desirous of an opportunity to define, as clearly as it is possible within the scope of this communication, the views that have guided me in my work and to elicit a discussion of them by this representative body of men.

The first point to determine in the discussion of this subject is, What clinically constitutes acute puerperal sepsis?

It is held by some that the term "acute" should be applied only to those cases that set in with severe symptoms during the first three days of the puerperium, and which usually terminate fatally any time between the fifth and the tenth day. Cases protracted beyond this period they would designate as "chronic." The importance of this definition becomes manifest when the question of radical surgical intervention is mooted. The adherents of this definition argue that the first class of cases end fatally no matter whether they are operated upon or not. In fact, according to one of the critics, all that a radical operation can do in these cases is to hasten the inevitable fatal termination.

The second class of cases, they say, run a "chronic course;" they usually get well of themselves, or if an operation is indicated it can be indefinitely delayed, and comes under the heading of those that are done for pelvic affections of a non-puerperal origin.

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[1] Read before the American Gynecological Society, May, 1899.